METHODS OF MEASURING LEVEL OF LIVING, SOCIAL PARTICIPATION AND ADJUSTMENT OF OHIO FARM PEOPLE

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Howard R. Cottam

Department of Rural Economics and Rural Sociology
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Preface

This report is a technical supplement to Ohio Agricultural Experiment Station Bulletin Number 624 entitled Levels of Living, Social Participation and Adjustment of Ohio Farm People, by A. R. Mangus and Howard R. Cottam. In the present report that publication is referred to as Bulletin No. 624. The purpose of the present report is to present a fairly detailed statement of the methods used in analyzing the standards of living of 299 Ohio farm families, and to present simplified and standardized scales for measuring levels of living and social participation.

GENERAL APPROACH

This study was planned to answer specific questions concerning the standards of living of Ohio farm people. The main purpose of the study was to determine the relationship between social adjustment, level of living, and social participation, but there were several subsidiary aims: (1) to show the effect that age, occupation, and certain other factors have upon the three major variables; (2) to construct a scale for the measurement of the level of living of Ohio farm families; (3) to construct a scale for the measurement of the quantity and quality of participation by adult farm people in organized groups; (4) to obtain ratings of adult farm people with respect to their social adjustments as indicated by the degrees of satisfaction they express with various aspects of their ways of living.

Information Obtained

The schedule used for recording data obtained in field investigation included six major sections. The first division, Family and Household Census and Identifications, provided space for recording information concerning age, sex, schooling, sickness, occupation, family composition, farm data, and miscellaneous facts about the family. The second section, Socio-economic Status, included a list of 75 items, the presence or absence of which was thought to indicate level of living. Section three, Social Participation, covered data concerning the nature of participation in organized social groups as well as informal social activities. These data were collected principally for the head of the family and his wife. Statements for rating the degree of satisfaction with particular kinds of participation were also provided in this section. The fourth section, Degree of Satisfaction with Present Conditions, included a list of 20 situations or aspects of the way of life including home and family, neighborhood and community living, and one general statement covering the "total situation," each of which was to be rated for the heads of families and their wives. Other information of a more specific nature was called for regarding the place preferred to live, the farm preferred, the probable disposition that would be made of a hypothetical $100 gift, and a comparison of living conditions of the respondent with those of associates. Section five dealt with Specific Adjustments of Head and Wife. This section was of secondary importance and was to obtain supplementary information

about particular types of adjustment. The subsection on health was used to provide health scores which became a part of the level-of-living index. The sixth section provided Ratings by the Interviewer of the condition of articles in the home, the intelligence of heads of families and their wives, personality traits of these two persons, and probable aims or goals of the family. In this section the ratings were based upon impressions of the interviewer. In addition to the information that was amenable to entry on the standardized form described above, interview notes were appended to each family schedule.

Sampling

A sample of 299 families was drawn within three counties representing distinct level-of-living areas of Ohio. That these families were fairly representative of the State is shown by comparisons with the data of United States census reports (bulletin 62[illegible], chapter I). There are, nevertheless, methodological problems of sampling which require detailed consideration.

Three practical difficulties made it impossible to conform completely to the fine points of sampling theory. The first limitation was made in the interest of economy of time and funds, only a comparatively small number of cases being included. To give assurance that all of the main classes of the population would be represented was difficult, for preliminary information concerning level of living, social participation, and social adjustment were not readily available. Various facts concerning level of living and a few about social participation, however, made it possible to make rough classifications. There was a dearth of information concerning social adjustment and this major variable could not be taken into account in sampling. The third principal sampling difficulty was that not every farm family could be identified or located on a map. Hence, it was impossible to assure every family absolutely the same chance of being drawn in the sample. Although the obstacles stated above would have been insuperable if the most rigorous sampling standard were adopted, it was possible to partially overcome all except that of the size of the sample.

The universe was defined as all farm families of Ohio, and areas were determined largely upon the basis of one variable, level of living. United States census reports and other secondary sources provided information on a county basis about various objective factors such as the proportion of families having automobile, radio, telephone, electricity, piped water in the house, the average value of dwelling, and other items. For the State of Ohio there was also available a composite level-of-living index composed of the six items just mentioned 1/ as well as valuable data concerning a large number of factors. A weighted composite index of 27 items was also prepared for each of the 88 counties of the State. 2/

1/ Lively, C. E. and Almack, R. B., A Method of Determining Rural Social Sub-Areas with Application to Ohio, Columbus: Department of Rural Economics, Ohio State University and Ohio Agricultural Experiment Station, Parts I and II. Mimeographed Bulletin No. 106, 1938.

2/ Details concerning the method of constructing this index are included in unpublished materials on file in the Department of Rural Economics and Rural Sociology, Ohio State University and Ohio Agricultural Experiment Station. Briefly, the method involves converting all items into standard units (standard deviation); preparing a tentative-composite score; testing the diagnostic ability of each item; and weighting in terms of diagnostic ability. Six of the items concern nonfarm families but their exclusion makes little difference in the distribution.

This index was made up largely of level-of-living items such as the six stated above but included one item (Farm Bureau membership) which concerned social participation. On the basis of this index it was possible to define three major level-of-living areas of the State. Furthermore, the counties falling into the various classes are almost contiguous and may be considered as distinct regions of Ohio (figure 1 in bulletin 622). These regions are: (A) an Urban-industrial Area of 17 counties stretching westward from Pennsylvania along Lake Erie shore plus 9 counties in the extreme Southwestern corner centering about Cincinnati, Dayton, Springfield, and Franklin County which includes the City of Columbus; (B) a contiguous area of distinctly good farm land made up of 32 counties in Western and Central Ohio; (C) a cluster of 29 adjoining counties in the hill section of Southeastern Ohio. It is also significant that these socio-economic regions conform very closely to type-of-farming regions of the State.

As a means of selecting three counties which, according to empirical evidence, could be regarded as being jointly similar to the State as a whole, the three groups of counties delineated above were considered as classes (strata) from which three "typical" counties might be selected for the sample. To determine which counties were most typical of the three areas, the indices described above were used as the primary basis for selection. Within class A, four counties; within class B, seven counties; and within class C, eight counties were tentatively selected as being sufficiently near the average farm level-of-living index of the group for preliminary consideration. These preliminary selections were then examined in the light of other objective criteria such as: (1) types of farming; (2) percentage of income earned by farm people from nonfarm sources; (3) average gross farm income per farm; (4) percentage of open-country population on relief in 1934; (5) percentage of farms in metropolitan districts; (6) value of farmer's dwelling (this was considered separately because it was believed to be of particular importance as a single factor since information was available by township as well as by county); (7) an index of relative variability of the value of farmer's dwelling among townships.

Agricultural economists and rural extension workers were asked to assist in the selection of the counties to represent the three groups. Since the problem of weighting the various factors used in selection was necessarily subjective, considerable reliance was placed upon the opinions of these judges whose acquaintance with the State was based upon first-hand experience.

To represent the Urban-industrial Region of the State, Mahoning County was selected. While the level-of-living index of the area (based upon 27 items) was 119.1, that of Mahoning County was 117.4. With the city of Youngstown located within its boundaries this county is believed to represent well the Ohio farms which are influenced by industries and big cities. An important factor in choosing this county was that it embraced approximately the same proportion of farms located in metropolitan areas 3/ (20 percent) as did the area as a whole.

The Western-agricultural Region, which was more homogeneous with respect to level of living than any other area, might have been well represented by any one of several counties but Allen County was regarded as the best. The level-of-living indices of the area and the county were 103.1 and 102.8 respectively.

3/ As defined by the Fifteenth Census of the United States in the report "Metropolitan Districts."

In the Southeastern-hill Section of the State, the poorest counties were located along the southernmost parts of the Ohio River banks. In every direction from this position (into Ohio) the level of living was found to be increasingly high, the counties adjoining the other two regions being highest. There was, nevertheless, a distinct line of demarcation between this geographical area and the other two. Washington County was regarded as most typical of the region, though it had an index of 73.5 as compared with 79.0 for the area.

The third sampling difficulty, that of identifying families, was met relatively well by using as the unit of sampling the farm dwellings located on county maps prepared by a State-wide Highway Planning Survey. An inadequacy of this sampling procedure within the universe is the fact that the events, i.e., the sampling units, were farm dwellings or households, whereas the unit of study in the project was the family. The absence of information concerning the identity of farm families made it necessary to seek a substitute method, and the one here adopted was believed to give more assurance that every family would have equal chance of being included and therefore greater independence than would any other available method.

The actual drawing of the sample proceeded as follows: First, numbers were assigned to each farm dwelling spotted on the maps described above. Using Tippett's tables of random numbers 4/ a number of farm households proportional to the total number of households in the county was drawn from each county. In using the highway planning maps as the basis of sampling, another practical difficulty was encountered; namely, it was impossible to count the exact number of farm dwellings in each county. This problem was a result of the mapping practice of showing several houses located together in a single block, making it impossible to distinguish those which were nonfarm. This construction of the maps did not lead to the exclusion of any farm dwellings, however, for all such places were assigned numbers and were included in the drawing. Whenever a house selected in the sample was found to be nonfarm it was simply discarded. The difficulty came only in determining the relative proportion of farms to be included from each county. All attempts to estimate the number of farms in each county by equating the proportions to figures given in the 1935 Census of Agriculture were futile, and a rough approximation between the census figures and the county estimates made from the maps was the best that could be achieved. Accordingly 110 interviews were made in Washington County, 96 in Allen County, and 93 in Mahoning County.

The crudeness of the sampling procedure limited the possible refinements which could be made in the calculation of sampling errors for applying tests of significance. The test of representativeness made was a comparison of the distributions of factors in the sample with figures of The Fifteenth Census of the United States and the 1935 Census of Agriculture. There was no evidence that any particular segment of the population was excluded, inadvertently or otherwise. Isolated households as well as those on highways were included; part-time as well as full-time farm families were interviewed; sample cases were distributed in approximately the same manner as the population as a whole; large farms as well as small ones appeared in about the same proportion as indicated in the United States census; and other factors such as age, sex, and family classes were distributed approximately as expected.

4/ Tippett, L. H. C., Random Sampling Numbers, London.

Collection of the Data

To find the families selected by the sampling methods described above, the sampling map was followed closely. Once a house was identified as belonging to the sample, an effort was made to gain an interview. Whenever possible both the husband and the wife were drawn into conversation, but it was frequently difficult for both of them to remain throughout the session which usually lasted from one to three hours, the average length of the visit was approximately two hours. All interviews were made during the winter months of 1939-40 by the author. A summary of the more tangible aspects of the interviews is shown in the following facts:

	Washington County	Allen County	Mahoning County
Total visits or calls at farms	166	170	173
Nonfarm families excluded a/	13	17	37
Houses abandoned or moved a/	13	5	0
Families not at home at time of call b/	19	15	21
Families requiring return visit (other reasons)	13	37	24
Families refusing an interview	1	2	3
Interviews made with families	110	97 c/	93

a/ Other families were drawn from the sample to substitute for these.
b/ These were revisited.
c/ One of these was excluded in analysis.

Since much of the data was of a highly personal nature, it was necessary to gain the confidence of the respondent before certain questions could be asked. Until sufficient rapport had been established, the interviewer made no attempt to get information to which there might have been objection.

Editing and Tabulation of Data

To assure completeness and consistency of the schedule entries, two persons other than the interviewer carefully edited each record, the schedule and notes. Wherever omissions or inconsistencies were found they were referred back to the interviewer for correction. The method of tabulating data was to assign codes to all schedule information and to enter the codes on three types of cards, separate cards being used for every family. The first type of card was an 8 1/2 x 11 sheet ruled into many subsections for entries concerning each level-of-living item. This form was used in the construction of a level-of-living index. The second type of card was an 8 1/2 x 11 sheet designed to include all social participation data, and used for the construction of an index of that variable. The other card was made for convenient sorting (4 x 6) and included all ratings of satisfaction, indices of level of living and social participation, personality ratings, and all other factors.

Tests of Significance

The analysis of the data in this study was largely statistical. Many of the relationships were so close that mere inspection of the distributions gave reasonable confidence for generalization beyond the sample. Other relationships were questionable and required some objective means of determining whether the distri-

butions of the sample might have occurred by chance. The choice of standard techniques of testing significance (i.e. applicability to the State) was limited, however, for preliminary examination of the distributions showed that social participation scores and social adjustment scores were J-shaped and that assumptions of normality were not justified. The level-of-living scores were, however, approximately normal in their distribution. As a means of testing relationships of the main variables to each other and to interfering factors the chi-square test was adopted. 5/

CONSTRUCTION OF INDICES OF LEVEL OF LIVING

Level of living has been defined in bulletin No. 622 (see preface above) as a segment of "standard of living" and approximately synonymous with "scale of living" or "plane of living."

Construction of a General Index of Level of Living

The procedure followed in the present study for constructing the index of level of living may be summarized under four major steps: (1) the preparation of a preliminary list of items; (2) the assigning of arbitrary weights to those items for a tentative-composite index of level of living; (3) a more rigorous selection of items by the application of statistical tests of significance; and (4) the assignment of significant weights to the chosen items for the construction of a final index of level of living. 6/

(1) The process of preliminary selection of items was not without precedence, for several excellent related studies have been made. 7/ Although these previous investigations were not made in rural Ohio, there was sufficient similarity to justify the assumption that items found to be important elsewhere were likely to show similar results for Ohio farm people. Drawing upon other studies is further justified in that level of living as a concept includes items which social scientists have in mind when they use the term. From this standpoint, items regarded by them as indicators of level of living should be included in an experimental or tentative list. Accordingly a list of items defined in other studies was prepared. To this array were added other items suggested by research and by extension workers familiar with living conditions among Ohio farmers.

For purposes of the present survey the usefulness of a given item was determined upon the basis of the extent to which the possession or nonpossession of that item was indicative of a family's level of living. Items such as silverware, cooking utensils, clocks, and other articles possessed by all or most families regardless of their economic status were excluded. Through discussions with rural economists, sociologists, and extension workers, and by an examination of

5/ Fisher, R. A., Statistical Methods for Research Workers, Edinburgh.

6/ This method is adapted from Sewell, William H., The Construction and Standardization of a Scale for the Measurement of the Socio-Economic Status of Oklahoma Farm Families, Stillwater: Oklahoma Agricultural and Mechanical College, Agricultural Experiment Station. Technical Bulletin No. 9, April, 1940; and Leahy, A. M., The Measurement of Urban Home Environment, Minneapolis: University of Minnesota Press, 1936.

7/ See Sewell, op.cit. for a summary of these studies.

published reports to find which items had been found diagnostic of economic level in other studies, the list of items was reduced to 77. These were then included in the final schedule for field enumeration. Further item selection was possible by inspection when enumeration completed for preliminary tabulation showed that 10 items failed to distinguish between families known to be "high" and "low" with respect to level of living. Exclusion of these items 8/ left only 67 of the original 77 items. Five more of these were abandoned because of incomplete entries and overlapping, 9/ leaving 62 items to be subjected to a more rigorous test (see table 1 of bulletin 622).

(2) The next step was to assign preliminary scores or weights to the level-of-living items. This process was largely arbitrary, but was based upon acquaintance (through interview experience) with the items enumerated in the 299 farm homes as well as their relative importance reflected in other studies. No difficulty was encountered in the case of items which were rated as "possessed" or "not possessed," uniform weights of 5 or 1 being assigned for every item. It was for categorical items (those for which graduated responses were required) to which it was necessary to assign varying scores. For example, brick houses were given 6 points; stucco houses, 5; painted frame, 4; and unpainted frame houses, 0. In the case of quantitative items uniform scores of 6, 4, 2, 0 were given, depending upon whether for that item a given family ranked in the upper fourth or any succeeding fourth of all families. Having once assigned the scores to each of the 62 items, the tentative-composite index of a family was found by addition of its item scores and division by the number of items scored.

$$S_t = \left(\sum_{1}^{n} W_a \right) \div n$$

Where S_t is the tentative-composite score, W_a is the arbitrary weight given a family for an item, and n is the number of items scored.

(3) The final selection of items for a general level-of-living index constituted the next step. Using their tentative-composite scores as the criterion, the 299 families were classified into two groups, the higher half and the lower half. Within each of these groups, the percentage of the 150 families possessing each of the 62 items was determined. For example, 27 percent of the lower and 82 percent of the upper groups had telephones. This information was now amenable to statistical tests of significance to determine whether the differences in the percentage of families possessing each item were sufficiently great that they could not be attributed to chance. Tests were made by calculating standard errors of sampling and by dividing the actual difference in percentage by the standard errors of the difference, i.e., the critical ratio.

In only 3 of the 62 items were the differences between the upper and lower families so small that they might occur by chance (i.e. more frequently than once in 370 additional samples, a critical ratio of 3 or more). These 3 items 10/

8/ Following items were excluded: arm chair; sofa pillows; pictures; calendars; flower garden; playing of musical instruments by husband, by wife; screens; health expenditures; days of school missed by children.

9/ Following items were excluded: replacement value of dwelling, pressure cooker, water in kitchen, dental work, expenditures for recreation.

10/ Includes the following items: musical instruments other than piano or organ, distance from trade center, and total acreage of farm.

were excluded leaving 59 for inclusion in the final index of level of living. It would have been possible to apply more stringent tests and thereby have a scale composed of fewer items, but the aim was to include as many significant items as possible rather than to construct a simplified scale with a minimum number of items.

(4) Having selected the items for the final scale, the remaining task was to assign significant "weights" or scores to each item. Since the type of index sought was one which would differentiate families at different levels of living, it was decided that two factors should be taken into account in the weights: first the differentiating or diagnostic capacity of each item, and second its frequency of occurrence. It was assumed that those items which were most important indicators of level-of-living--those which separated the high classes from the low classes--should be given most weight. Furthermore, a valid item such as telephone, possessed by only 54 percent of all families, should be given more weight than one like linoleum for the kitchen floor, which was possessed by nearly all families.

(4a) To determine the diagnostic capacity of each item, the method of classifying the families into high and low levels upon the basis of the tentative-composite score (see step 3 above) was extended. Each of these two classes was again divided making four groups of families ranging from lowest to highest with two intermediate groups. It was then possible to find out which items were most common among the upper classes and least common among the lower ones. Electric sweepers, for example, were possessed by only 3 percent of the families of the lowest quarter, but by 97 percent of the highest, while 15 and 56 percent, respectively, of the lower and higher intermediate quarters had them. This item was one of the most diagnostic, but most of the other 58 items were found in increasing percentages from the lowest to the highest quarters of families. To determine statistically the relative diagnostic capacity of each of the 59 items, differences between the percentages in successive quarters, extreme quarters, and halves were tested by the critical-ratio method. The score representing diagnostic capacity of an item was the average of the five critical ratios calculated in testing each item.

(4b) Frequency of occurrence, the second factor considered in determining final weights, was handled by converting the percentage of all families possessing a given item into standard units by referring the percentage to a table of the values of the normal probability integral. It must be understood that two kinds of items were involved, those which were dichotomous and rated as either possessed or not possessed, and the others which were called categorical since they were rated in more than two categories. For example, a sweeper may be in one of four classifications: electrical, mechanical, hand, or none. Another point to be kept in mind is that possession of certain items was assumed to be "desirable" and that certain types of categorical items were "more desirable" than others. In handling categorical items it was necessary to array the items from the least desirable to the most desirable. For example, electrical sweepers were said to be more desirable than mechanical ones, mechanical ones better than hand ones, and hand sweepers better than none. Since this classification is exhaustive, the percentage of families possessing one or another of them is 100, and for the respective categories, 41, 1, 10, and 48. In an accumulated array of these items the most desirable item was conceived as lying between 59 and 100, the second between 58 and 59, the third between 48 and 58, and the least desirable between 0 and 48. A simple method of assigning weights giving the highest score to the most desirable category would have been to take the mid-point of the range in the accumulated array as the score. This would have made the respective scores 79.5, 58.5, 53.0, and 24.0. Since it was desired to exaggerate the relative weights of the two extreme categories, however, these mid-percentages were converted into

standardized scores by the following method: To regard arbitrarily mid-points of 50 percent as zero, higher percentages than 50 as positive, and the percentages lower than 50 as negative; to convert the scores arrived at by taking mid-points of the range on an accumulated array into standard-deviation units by reading directly from a standard area table of the normal probability integral. The possible range of final scores was then approximately from a minus 3 sigma (standard deviation) units to a plus 3 sigma units. Mid-points nearest to 50 percent were by this method exaggerated less than were those approximating 100 percent and those approximating zero. In using this method the assumption of normality in the distribution of the items is implied. It could be argued, however, that sigma scores were used merely as a convenient method adopted to augment equally in two directions from the median (the 50th percentile) the mid-points of the range of the accumulated percentages described above. Final sigma scores for the four categories of sweepers referred to above were: .83, .21, .08, and -.71 respectively. In the case of dichotomous items the method was identical. Using the telephone as an example, 54 percent of all families possessed this item and 46 percent did not. Respective mid-points were 77 and 23; sigma scores were .61 and -.74.

(4c) Taking account of both diagnostic capacity and frequency of occurrence, the final weight for each item was the product of the two weights. For example, possession of a telephone was 8.01 times 0.61 or 4.89; for nonpossession it was 8.01 times -0.74 or -5.93. One further refinement was made, however, to eliminate the negative values which were introduced by the use of standard-deviation scores. This was accomplished by the addition of a constant 20 which made the above example of telephones 24.89 in the case of possession and 14.07 for nonpossession. These values were the final weights given to that item.

Once the weights of each of the 59 items had been determined by the methods described above calculation of total level-of-living indices for each of the 299 families was simple. Each family was scored on the 59 items by the appropriate weights for possession or nonpossession and these scores were totaled and divided by 59. Wherever information was available for fewer than 59 items the number available was used as the divisor.

Construction of Specific Indices of Level of Living: Types of Items

To permit independent analysis of related types of level-of-living items six specific indices were constructed: education, communication, economic security, housing, safety and sanitation, and electrical conveniences. The classification of items into these categories was made arbitrarily. It was not intended to be either exhaustive (to include all items) or to have mutually-exclusive classes (footnote 7 of bulletin 622). Scores of each item entering into these specific indices were taken from the scores assigned in the total index of living. The principal purpose of these specific indices was to test the relationship of particular items of level of living to social adjustment and to social participation.

Validity of the General Index of Level of Living

To determine whether the index of level of living measures what it purports to measure (validity), several tests were applied. Perhaps the most meaningful criterion is that at the outset level of living was defined operationally as including several items, all of which were retained in the final scale. Furthermore, these items are those which social scientists usually have in mind when they use the concept. Some of these items were, however, excluded either

purposely because they failed to be diagnostic of total level of living, or inadvertently due to incomplete information. For this reason, other tests of validity were required.

A common-sense test of validity is the observation that arbitrary weightings assigned to the items were not changed markedly by the refinement described above. The tentative-composite score and the final index were correlated r = .98; Er = .06 (standard error of sampling). 11/ In practice the improvement accomplished by statistical testing was negligible, but this could not, of course, be foreseen.

The most conclusive test of validity, statistically speaking, was the high correlation with Sewell's standardized test devised to measure level of living. 12/ When the 299 cases were scored by Sewell's weights, a correlation of r = .93; Er = .06 was found with the weights here adopted.

Also important in strengthening the case of validity is the fact that the two factors (diagnostic ability and frequency of occurrence) which entered into the weights had similar influence upon the index. That these factors are almost identical is indicated in the coefficient of correlation r = .99; Er = .18. 13/ Indeed, no particular improvement in the index was gained in using both factors as weights.

Another evidence of the validity of the scale is that it differentiated various groups in the manner expected from known relationships. The average level-of-living scores by this index for the three counties studied differed in approximately the same manner as by an independent index of level of living calculated from United States census data (a composite score of 27 items, see chapter I, above). Both indices show the Southeastern-hill County (Washington) to be lowest, the Western-agricultural County (Allen) to be second, and the Urban-industrial County (Mahoning) to be highest. These differences of the index here adopted were found to be significant by the chi-square test (2 x 3 table, P is less than .01). In addition, relief recipients had significantly lower level-of-living scores than did nonrelief families. The scores of occupational classes also conformed to expectations.

Reliability of the General Index of Level of Living

The information concerning level of living was recorded with reasonable accuracy although some error was involved. As a means of checking the schedules, brief questionnaires were sent to one-half of respondents soon after the completion of interviews in the first county (Washington). An error of 2 percent was found in the case of telephone entries and 6 percent in reporting newspaper

11/ $Er = 1 \div \sqrt{n - 1}$ where n is the number of events in the sample.

12/ Sewell, op. cit. The social participation items of his scale were not included in making this test.

13/ This error represents the summation of two separate errors: first, that involved in the original sample $Er = 1 \div \sqrt{n - 1}$; and second that in the sample of 50 from the limited universe of 299 or $Er = (1 \div \sqrt{n - 1}) \cdot \sqrt{(N - n) \div (N - 1)}$ where N is the number of families in the universe and n is the number in the sample.

subscriptions. "Number of rooms" reported on the interview schedules and on the check schedule corresponded closely. The Pearsonian coefficient of correlation r between the two reports was .94; Er = .18. The questionnaires returned represented 93 percent of 54 which were mailed.

To test the reliability of the 59 items in the final scale in consistently measuring level of living, two sets of the items were prepared by drawing numbers from an urn and including 29 in one set and 30 in the other. Scores were then calculated for each family (a random sample of 50) on both of the sets, and the correlation of the pairs of scores was tested. Pearsonian r = .88 which, when corrected for attenuation by the Spearman-Brown formula was:

$$\bar{r} = \frac{2\ r}{1\ +\ r} = .93; \qquad Er = .18$$

According to usual standards, the items of the scale may be regarded as reliable.

Additional tests of reliability were made by calculating Pearsonian coefficients of correlation between each of the specific indices of level of living (i.e. cluster of similar items) and an index of all other level-of-living items which are not included in the six particular cluster of items being tested. 14/ Each of the six specific indices was found to be significantly diagnostic of the total index but more of the relationships are perfect and knowing the total or general index does not make possible absolute prediction of any specific index or score of a cluster of items. Following is a summary of the results of these tests:

$r_{a.(s-a)}$	= .69;	$\bar{r}_{a.(s-a)}$	= .82;	Er = .18
$r_{b.(s-b)}$	= .76;	$\bar{r}_{b.(s-b)}$	= .86;	Er = .18
$r_{c.(s-c)}$	= .87;	$\bar{r}_{c.(s-c)}$	= .93;	Er = .18
$r_{d.(s-d)}$	= .60;	$\bar{r}_{d.(s-d)}$	= .75;	Er = .18
$r_{e.(s-e)}$	= .83;	$\bar{r}_{e.(s-e)}$	= .91;	Er = .18
$r_{f.(s-f)}$	= .74;	$\bar{r}_{f.(s-f)}$	= .85;	Er = .18

Where r is the uncorrected Pearsonian coefficient; $\bar{r}$ is the coefficient corrected by the Spearman-Brown formula; s refers to the total index of level of living; a refers to index of educational level; b, to the index of communication; c, to the index of security; d, to the index of housing; e, to the index of safety and sanitation; and f, refers to the index of possession of electrical conveniences. The standard errors of sampling shown (Er) include both the errors involved in drawing the original sample of 299 and in drawing 50 from that limited universe of 299 to make the test.

Abbreviated Standardized Scales to Measure Level of Living of Ohio Farm People

The scale of 59 items was demonstrated to be a valid and reliable measure of the level of living of Ohio farm people. For the present study there was an advantage in including as many significant items as possible. For the purpose of shortening the work in future studies, however, a scale of fewer items is desirable, providing validity and reliability are not sacrificed. To determine

14/ These tests might have been made by relating the index of a cluster to the general or total level-of-living index, but the cluster items were subtracted from the total index to avoid spurious results.

the effect of reducing the number of items, three separate scales of varying lengths were devised by retaining in the shortest scale, A, the 14 items which were found to be most diagnostic of the total level of living; in the next shortest scale, B, the 14 items of scale A plus the 8 items which had the next highest critical ratios; and in scale C the items of A and B plus the 8 items in order of diagnostic ability. Three exceptions were made, however, where only one of two very nearly similar items was selected. In the place of an excluded item the next ranking item was included. To the items selected to be retained in the three abbreviated scales the weights were assigned by taking account of both diagnostic ability and frequency of occurrence as described above.

Validity of scales A, B, and C was tested by calculating Pearsonian coefficients of correlation for each scale with the total scale of 59 items. By this test all three of the shortened scales were found to be valid measures of level of living of Ohio farm families.

$$r_{sA} = .97; \quad Er = .06$$
$$r_{sB} = .96; \quad Er = .06$$
$$r_{sC} = .97; \quad Er = .06$$

Where s represents the total index, and A, B, C, the abbreviated scales.

Reliability of the items comprising the shortened scales in measuring consistently level of living was tested by the split-half method. For purposes of selecting alternate items, the items were ranked upon the basis of diagnostic ability as explained earlier. Since reliability is known to increase with length of the scale, scale A was less reliable than the others although it may be regarded as highly reliable by usual standards. The following raw and corrected coefficients of correlation were found:

$$r_{A1 \cdot A2} = .86; \quad \bar{r}_{A1 \cdot A2} = .92; \quad Er = .06$$
$$r_{B1 \cdot B2} = .88; \quad \bar{r}_{B1 \cdot B2} = .93; \quad Er = .06$$
$$r_{C1 \cdot C2} = .99; \quad \bar{r}_{C1 \cdot C2} = .99; \quad Er = .06$$

Where r is the uncorrected coefficient of correlation; $\bar{r}$ is the coefficient corrected by the Spearman-Brown formula and the subscripts 1 and 2 represent halves of each of the scales A, B, and C.

Since the shortest scale of only 14 items was found to be both valid and reliable it was adopted as a standardized scale for measuring level of living of Ohio farm families. An arrangement of scale A designed for field use is presented on page 13.

Not all of these weights conform to common-sense expectations. They can be understood only by knowing the procedure followed in their deviations. Should common-sense weights be desired for a scale that could be easily understood by the nontechnical person, arbitrary weights could be substituted for those given in scale A. Some validity and reliability would be sacrificed, however.

$$r_{sT} = .92; \quad Er = .18$$
$$r_{T1.T2} = .80; \quad \bar{r}_{T1.T2} = .89; \quad Er = .18$$

Where T stands for the score on scale A items by arbitrary weights. Other symbols are as defined above. Only 50 cases were used for this test.

Scale A.- A LEVEL OF LIVING SCALE FOR OHIO FARM FAMILIES

Name of family _____ No. _____
Post office address _____ R.F.D. No. _____
County _____ Township _____
Interviewer _____ Date _____

Item and scale value	Score -	Score +
Telephone: yes ___ (+5); no ___ (-6).....		
Lights: electric ___ (+4); gas, acetylene, carabide ___ (-3); other ___ (-8)....		
Refrigeration: mechanical ___ (+7); ice ___ (+1); other or none ___ (-5).....		
Washing machine: power ___ (+2); hand ___ (-5); none ___ (-8).....		
Iron: electric ___ (+5); fuel ___ (-2); other or none ___ (-8).....		
Sweeper: electrical ___ (+11); mechancial ___ (+3); hand a/ ___ (+1); none ___ (-9).....		
Water: piped ___ (+6); pumped ___ (0); other source ___ (-5).....		
Kitchen sink: yes ___ (+3); no ___ (-6).....		
Toilet: indoor ___ (+9); outdoor ___ (-2); none ___ (-16).....		
Heating: furnace ___ (+4); heater b/ or gas fireplace ___ (-2); range ___ (-7); other ___ (-8).....		
Floors: painted or varnished ___ (+3); unfinished c/ ___ (-7).....		
Magazine subscriptions d/: 7 or more ___ (+8); 4-6 ___ (+2); 2-3 ___ (-2); 0-1 ___ (-8).....		
Books: 100 or more ___ (+8); 50-99 ___ (+2); 10-49 ___ (-2); fewer than 10 ___ (-8).....		
Bookcase: yes (+4); no (-5).....		
Total family score		

a/ Small box-sweeper.
b/ Include coal or wood heaters or circulators.
c/ Consider badly checked or scarred paint or varnish as unfinished.
d/ Include those regularly purchased at news stand.

For purposes of comparing any subsequent sample of Ohio farm families scored by scale A with the present sample of 299 families, table 1 has been prepared. A score of zero is approximately the average (mean and median) of the State as a whole as estimated from the present sample. More precisely, scores lower than -41 are in the lowest quarter; scores between -41 and -1 are in the second quarter; scores between 0 and +43 are in the third quarter and scores above +43 are in the highest one-fourth of all families. Comparative values based upon arbitrary weights are also shown in table 1.

Table 1.- QUARTILE AND DECILE VALUES OF LEVEL-OF-LIVING SCORES

Quartile	Score: Scale A a/	Score: Scale A_T b/	Decile	Score: Scale A	Score: Scale A_T	Decile	Score: Scale A	Score: Scale A_T
1	-41	33	1	-73	17	6	17	57
2 c/	- 1	50	2	-53	28	7	36	64
3	43	68	3	-31	37	8	50	71
-	--	--	4	-15	44	9	66	77

a/ Scored by the weights shown in Scale A, above. 294 families.
b/ Arbitrary weights described above were assigned to 14 items of scale A.
c/ Median, decile 5, and quartile 2 are same value as mean in this distribution.

RATING AND SCORING SOCIAL ADJUSTMENT

Standard of living as defined in the introductory chapter of the bulletin 622 (see preface above) includes not only the possession of goods or services and the participation in social groups, but also the satisfactions that come from possession or participation. It is the degree of satisfaction or social adjustment with which the present chapter is concerned.

Rating and Scoring Social Adjustment

The expressions of satisfaction and dissatisfaction by respondents were the basic data of social adjustment in the present study. This requires some qualification, however, for the degree of satisfaction could not be measured simply in terms of the number of adverbs or adjectives a person used to express his attitude. The method adopted in this project was to get direct expressions of the degree of satisfaction with many specific situations; to put a great many pertinent questions to the respondent until the interviewer felt that he knew enough concerning the attitude to make a rating by checking the relative position of a given individual on one of five equal-distant positions along a scale ranging from "entirely satisfied" to "entirely dissatisfied." Separate ratings were made not only for "total satisfaction" with the way of life, but also satisfaction with 19 of its specific aspects. Because of time limitations, individual ratings were made for only the head of the family and the wife. When both persons were present they were given separate ratings. The percentage of these persons given various ratings for each of the 20 standard-of-living situations is shown in bulletin 622 (table 3).

Since the ratings of adjustment were subjectively made, only upon the assumption that the interviewer was able properly to place them on the scale of satisfaction-dissatisfaction can they be represented by quantitative values. That the scale itself represents five equidistant intervals cannot be questioned, but the entries made on the scale by the rater are subject to error. The five categories of the scale were assigned values from 1 to 5 and whenever the interviewer placed a check in the space indicating "entirely dissatisfied" he did so with the understanding that this meant a value of 1. For "mostly dissatisfied" it meant 2; for "equally satisfied and dissatisfied," 3; for "mostly satisfied," 4; and for "entirely satisfied" the intended value was 5. Accordingly these weights were used in the analysis whenever scale values were required.

Of the 20 ratings which were made, the most important was the one which represents "total adjustment" satisfaction with the way of life considered in its entirety. This rating was made after the other 19 ratings of specific situations had been made, taking account of all information learned concerning the likes and complaints of the respondent. He was asked to express his satisfaction with all of the situations previously mentioned "everything considered."

Each of the specific aspects of the ways of life were regarded important, but it was expedient to classify them into types. For example, seven of the specific ratings were concerned with community services. Because of their similarity they were pooled to make a composite rating of adjustment to community services.

Although the heads of families and their wives were given ratings as individuals, the family was regarded as the unit of study. If both the head of the

family and his wife were present during the interview and ratings were made for both of them the family adjustment was represented as an average of their individual ratings. Whenever only one of these two persons was present, his score was used to represent the family. It would have been highly desirable to make comparisons of the adjustments of the heads of families and their wives but the study was not designed for that purpose. The method adopted makes a broad assumption in letting one person represent a family, but was chosen as a matter of expediency. In many cases the husband had to excuse himself to take care of the farm chores or the wife had to leave to prepare a meal. When both persons were able to remain throughout the interview (about one-fourth of all cases) the statements of one seldom refuted those of the other. The median scores of husbands and wives rated when two persons were present were almost identical for every rating. When the distribution of the total adjustment scores of heads and wives who were present for the interview were compared by the chi-square test no significant difference was found (table 2).

Table 2.- TOTAL SATISFACTION OF FAMILY HEADS & WIVES BY INTERVIEW SITUATION

Adjustment score	All cases a/		Interview situation b/			
			Both present c/		Only one present d/	
	Head	Wife	Head	Wife	Head	Wife
Number of persons	244	165	134	111 e/	58	45
Percent of persons	100	100	100	100	100	100
1 (Entirely dissatisfied)	3	1	2	2	0	4
2 (Mostly dissatisfied)	7	12	7	11	14	13
3 (Equal)	17	18	19	14	15	20
4 (Mostly satisfied)	44	50	48	51	33	58
5 (Entirely satisfied)	29	19	24	22	38	5
Median score	4.0	3.9	4.1	4.1	4.3	3.7

a/ Includes heads and wives of all sample families.
b/ Only schedules where head and wife were both living in present family unit were included.
c/ By chi-square test (3 x 2 table) P greater than .50.
d/ By chi-square test (3 x 2 table) P less than .01.
e/ Although both persons were present, ratings were not always possible for both of them; hence, the difference between the number of heads and wives.

That the presence of either spouse during an interview influenced the response of the other is strongly suggested in the differences between the heads of families and wives interviewed separately (tables 2 and 3). The median scores of adjustment to particular aspects were widely different in some cases and in the same direction in all cases. The distribution of the scores of total adjustment of the family heads and wives is shown by the chi-square technique to be significant but different (table 2). This comparison is not, however, a decisive test of a real difference in the degree of adjustment of heads of families and wives although it suggests that husbands may be slightly better satisfied with their situations than are wives. This seems to be particularly true with respect to the farm and farming and living conditions. Because of the suggestive value of comparisons, some of the tests of relationships of the major variables of this study are given separately for the heads of families and for wives as well as by family score. In certain cases where individual scores could be more easily handled to portray data such as classifications of religious affiliation (which were in many cases different for the head and wife) individual scores were used in preference to family scores.

Table 3.- MEDIAN ADJUSTMENT SCORES OF FAMILY HEADS AND WIVES BY INTERVIEW SITUATION a/

Aspect of living	Median adjustment scores			
	Both present		Only one present	
	Head	Wife	Head	Wife
All aspects	4.1	4.1	4.3	3.7
Health	4.1	4.1	3.5	3.1
Home and family	4.5	4.5	4.5	4.2
Living conditions	4.1	4.0	4.2	3.7
Farm and farming	4.4	4.4	4.5	3.8
Social-recreational	4.7	4.6	4.8	4.4
Neighborhood	4.9	4.9	4.8	4.6
Community services	4.6	4.6	4.7	4.6

a/ Only schedules where head and wife were both living in present family unit were included.

Validity and Reliability of Adjustment Scores

Much has already been said of the extent to which the scale measures consistently (reliably) what it was intended to measure, but no conclusive objective tests have been made. The highly subjective nature of the ratings made testing difficult. It would have been desirable to repeat the ratings with the same farm people at later dates and by different interviewers, but that was not possible in the present study. Validity could have been further tested by administering standardized scales of social adjustment to the respondents had there been time and had they been capable of using the rather academic pencil-and-paper tests. The fact that the interviews were already lengthy made it seem inadvisable to carry the testing beyond the scope of the present research.

The interrelationships of the various ratings of aspects of social adjustment are crude tests of the reliability of the scores, particularly the correlations of each particular aspect with the total adjustment score. High scores of total adjustment were found to be significantly associated with high scores of each type (table 4).

A further indication that the social adjustment ratings are probably valid is seen in the high degree of association between the ratings and statements from Hugh M. Bell, The Adjustment Inventory. Occupational, health, emotional, and home adjustment scores on the adapted Bell scale are closely related to the corresponding ratings in the present study (table 5). "Social" adjustment on that scale, however, does not correspond closely to ratings of social-recreational adjustment (its most comparable category) in this study (table 5). The use of this means of validation is subject to considerable error, for the ratings by the two methods were not thoroughly independent, i.e., one rating likely influenced the other. Since the methods of scoring were different, they serve as rough checks upon each other.

Table 4.- MEDIAN ADJUSTMENT SCORE OF SPECIFIED ASPECTS OF LIVING BY DEGREE OF ADJUSTMENT TO THE TOTAL SITUATION

Aspect of living	All classes	Entirely a/ satisfied	Mostly b/ satisfied	Not c/ satisfied
Health	4.2	4.3	4.3	3.6
Living conditions	3.8	4.5	3.8	2.9
Home and family	4.2	4.9	4.2	3.2
Farm and farming	4.2	4.8	4.2	3.7
Social-recreational	4.7	4.9	4.7	4.1
Neighborhood	4.7	4.9	4.7	4.4
Community services	4.6	4.8	4.7	4.2

By chi-square tests of the relationship of each of the 7 aspects of living to total adjustment each was found highly significant (on the .01 level). Between 292 and 299 families were the bases of calculations of medians.

a/ Includes scores of 4.5-5.0, approximately 73 families.

b/ Includes scores of 3.5-4.4, approximately 138 families.

c/ Includes scores of 1.0-3.4, approximately 87 families.

Table 5.- MEDIAN ADJUSTMENT SCORE OF SPECIFIED ASPECTS OF LIVING BY DEGREE OF ADJUSTMENT TO CORRESPONDING ASPECTS OF LIVING AS RATED ON SCALES ADAPTED FROM "THE ADJUSTMENT INVENTORY" a/

Aspect of living	Classification of "The Adjustment Inventory"			
	Total	Poor	Medium	Good
Farm and farming b/	4.2	3.6	4.1	4.8
Home and family c/	4.4	2.8	4.3	4.6
Health d/	4.2	3.1	3.9	4.7
Social-recreational e/	4.7	4.8	4.5	4.7

a/ Hugh M. Bell, "The Adjustment Inventory," Palo Alto: Stanford University Press, 1934. Selected statements were taken from this scale for inclusion on the field schedule. For each statement indicating poor adjustment 1 point was given to a person.

b/ Bell's "occupational" statements which were used are not entirely adequate. Five statements were included. By chi-square test (2 x 3 table) P less than .01.

c/ Twelve statements were taken from Bell. These were believed to be indicative of the ratings made in the present study. By chi-square test (2 x 3 table) P less than .01.

d/ Seventeen statements of specific illnesses. This part of the scale is more objective than any other. By chi-square test (2 x 3 table) P less than .01.

e/ Six statements were used. They are not comparable to social-recreational adjustment but more nearly so than any other part of the scale. By chi-square test (2 x 3 table) P greater than .05.

CONSTRUCTION OF INDICES OF SOCIAL PARTICIPATION

Social participation has been defined in the printed bulletin 628 (see preface above) as one aspect of standard of living, an aspect which includes a wide and diverse range of social activities in which individuals engage to satisfy basic needs. It embraces participation in formally organized groups and activity in casual or informal ways.

Construction of an Index of Formal Social Participation

The present effort to construct a measure of formal social participation is not the first of its kind. Many studies of standards of living have included data on activity in organized social groups and a large number have described informal social activities in relation to consumption habits and other standard-of-living behavior. 15/ The scales devised by F. Stuart Chapin in Minnesota studies 16/; by E. L. Kirkpatrick, J. H. Kolb, and others in Wisconsin 17/; and by D. E. Lindstrom and M. W. Dawson in Illinois 18/ are of particular importance since efforts were made to construct composite scores of formal participation. Recently William H. Sewell 19/ prepared a scale of socio-economic status in which 8 of the 36 items concern social participation.

None of the available indices were regarded as sufficiently sensitive for use in the present study and an attempt was made to overcome some of the inadequacies of the studies mentioned. It was assumed in constructing the present index that five main types of participation (affiliation, attendance, contributions, committee work, and officerships) are each important criteria of formal participation, and that all of them should be taken into account. Accordingly the main methodological task was that of combining them in some reasonable and meaningful manner. Plans were laid to convert each of the categories into a standard unit so that the five could be added directly, knowing that approximately equal weights were being assigned to each. The first difficulty came when the distributions of raw scores in each category were observed to be extremely J-shaped with the largest proportion falling in the first or zero interval. This meant, of course, that the standard deviation could not be adopted as the unit of measure since it implies normality. The quartile deviation was temporarily adopted, but was soon abandoned because in both of the leadership categories (officerships and committee memberships) the first and fourth quartiles fell in the zero interval. The procedure finally adopted was an adaptation of the quartile deviation; namely, decile-deviation units calculated by subtracting the first decile of each of the 5 categories from the ninth decile of the corresponding category and dividing by 2. This

15/ See Williams, Faith M., and Zimmerman, Carle C., Studies of Family Living in the United States and Other Countries, Miscellaneous Publication No. 223, Washington: United States Department of Agriculture, 1935, pp. 455-609.

16/ Chapin, F. Stuart, "Social Participation and Social Intelligence," American Sociological Review, Vol. 4, No. 2, April 1939, pp. 157-166.

17/ Kirkpatrick, E. L.; Kolb, J. H.; Inge, Craegh; and Wilcden, A. F.; Rural Organizations and the Farm Family, Madison; Wisconsin Agricultural Experiment Station Research Bulletin 96, 1929.

18/ Lindstrom, D. E. and Dawson, W. M., 4-H Club Work: Effect on Capability and Personal Quality, Urbana: University of Illinois Agricultural Experiment Station, Bulletin 451, 1939.

19/ Sewell, op. cit. pp. 45, 82-83.

gave a standard measure for each category. For example, in the category "affiliation" the ninth decile was 4.0 whereas the first decile was 0.0. The difference between these values divided by 2 gave a standard measure of 2.0. Expressed algebraically:

$$D = \frac{D_9 - D_1}{2}$$

Where **D** is the decile deviation; D_9 is the ninth decile, and D_1 is the first decile. Standard measures found by the same method for the other 4 categories were: attendance, 57.0; contributions, $11.10; committee memberships, 0.8; and officerships, 0.6.

The second step was to convert the raw participation scores of each category for each of the 299 families into standard units. Family scores, it should be explained, were the arithmetic average of the participation of the head of the family and his wife (only these 2 persons were included). The process of making these conversions was first to express each raw score in terms of its deviation from the average (the median in this case) of all families, and then to divide this expression by the standard measure, that is,

$$P_s = \frac{X - M_d}{D}$$

Where P_s is the converted participation score of a family for "s" category; X is the raw unconverted score for the same category; M_d is the median score of all families for the category; and D is the standard unit, the decile deviation. Median scores for the five categories were 1.5; 26.9; 5.3; 0.0; and 0.0 in the order described above.

The third step was to combine the converted scores for each of the five categories of participation for a family. This was accomplished by direct addition under the assumption that each was of equal importance since there was no known valid basis for weighting them otherwise.

$$P_f = P_{s1} + P_{s2} + P_{s3} + P_{s4} + P_{s5}$$

Where P_f is the score of formal participation for a given family, subscripts indicate the categories, and other symbols are as indicated above.

To illustrate the entire procedure of determining a score for a given family the following example is presented. Together the husband and wife were affiliated with 7 organizations or an average of 3.5 each. Since the median number of affiliations for all 299 families was only 1.5, this family scored 2.0 above the average. When this was divided by the standard measure for affiliation, the quotient was 1.0, which represents the converted or standardized score of affiliation for the family. Considered jointly, the husband and wife attended 64.0 functions of organized groups during the schedule year, an average raw score for the family of 32.0. Subtracted from the median of all families the $(X - M_d)$ value was 5.1 and this remainder divided by 57.0, the standard unit for attendance, was 0.1. In the case of financial contributions the raw score per person was $19.50, the $(X - M_d)$ value divided by 11.1 (the standard unit for contributions) was 1.3. The husband had served on 2

committees and the wife on none, an average of 1.0. Subtracting 0.0 (median committee work) from 1.0 and dividing by the standard unit, the family score for committee work was 1.3. No officerships were held by either person and the score was, therefore, 0.0. Adding the five converted scores together, the family score was 3.7. One further step was taken, however, to avoid the use of the negative signs introduced in subtracting each X value from the median; namely, to add a constant of 1.0 to each of the categories (i.e., 5.0 in all). This made the final score of formal social participation for the family used in the above illustration 8.7. For the 299 families, the scores ranged from 3.3 to 28.6. The scores of 3.3 represent no participation whatsoever in organized groups. In the family having the highest score (of the 299 families) the head of the family belonged to 7 organizations, attended 182 functions, contributed $55.00 to organizations, was on 18 committees during the year, and held 4 officership positions. No wife was present and the family score was, therefore, that of the head of the family.

For convenience in subsequent reference to formal participation, "lowest," "medium," and "highest " classes were arbitrarily designated. The lowest class was 2-3; medium, 4-7; highest, 8 and over. The persons in the lowest class are referred to as nonparticipants, those in the medium class as occasional participants, and those in the highest class as active participants.

Validation of the Formal Social Participation Score

One important evidence of the fact that this scale measures what it was designed to measure is that all of the items embraced by the index are defined by the students of social participation as significant components of the concept. Furthermore, all of the components of formal social participation mentioned by other students are included.

When the scores calculated by the present method were compared with scores by the method of Chapin, the Pearsonian coefficient of correlation was r = .68; standard error of sampling = .06. With the Kirkpatrick and Kolb method, two different interpretations of the weights were tested, one using the values they assigned in the above mentioned study 20/ and the other using averages of the raw scores from the data of the present study. In the comparison by the first method of weighting r = .81; Er = .06; in the second test r = .76; Er = .06.

An exact comparison with the section of Sewell's scale 21/ dealing with social participation was impossible since 2 of his 8 items include Sunday school participation. These items were included with other church groups in the present study. A correlation coefficient of the six comparable items and the present scale, was, however, calculated: r = .66; Er = .06. These relationships are highly significant, and there can be little doubt but that the present scale measures the same thing that Chapin, Sewell, and Kirkpatrick, et. al. were measuring. The claim is made on logical grounds aside from these statistical tests, however, that the method of the present study is a refinement of the other studies.

20/ Kirkpatrick, Kolb, Inge, Wileden, op. cit. p. 10. One affiliation, 100 points; one meeting attended, 100 points; one contribution, 100 points; one committee service, 25 points; one office, 75 points.

21/ Sewell, op. cit., p. 45.

Further confidence is gained in the use of the scale by the regularity with which it differentiates groups in the manner that was expected. For example, extremely old persons scored lower than those slightly younger; farm owners scored higher than tenants or laborers; and families with a larger number of children scored low on the scale.

Reliability of the Scale of Formal Social Participation

No check was made as to the accuracy of the participation entries on the field schedules. It is admitted that the information concerning participation is subject to considerable error since it was obtained by asking the respondent to report in retrospect the organizations of which he was a member and to estimate the number of times he attended meetings, the amount he contributed to organizations, and the number of leadership positions in which he served. It is believed however, that the membership information was fairly accurate since specific types of organizations were mentioned during the questioning to help recall participation. The extent of attendance was less accurate since the approach was to ask how many meetings per week the respondent attended during the last year. The amounts of monetary contributions were only approximations, the interview technique being to suggest round-number figures and to ask which of them would most accurately represent the contributions. A few people refused to make estimates of the amount of money they gave during the year. Estimates of service in the form of committee memberships were probably accurate for persons who only occasionally had positions of this type, but the active participants had difficulty in remembering how many times they had held such appointments or elections. The reporting of officerships is believed to be quite exact.

That all five of the categories measure consistently the same thing is indicated in the fact that each of them is related to the total index (table 6). Furthermore, each is related significantly to the combined effect of the other four. 22/ The relationships are not, however, sufficiently correlated to make possible accurate prediction of the other four by knowing any one category. The best category for this purpose was attendance, but knowing the extent of attendance for a family would be only 33 percent better than knowing nothing at all about it so far as prediction of total participation is concerned. 23/ More exactly:

$r_{a.bcde} = .57$; Er = .06
$r_{b.acde} = .74$; Er = .06
$r_{c.abde} = .54$; Er = .06
$r_{d.abce} = .58$; Er = .06
$r_{e.abcd} = .59$; Er = .06

Where a represents affiliation; b, attendance; c, contributions; d, committee service; e, officerships held; r, the Pearsonian coefficient of correlation; Er, the standard error of sampling.

22/ To avoid spurious correlation separate scores were calculated for each of the 299 families for every possible combination of the other four of the five categories. Each of these combinations was then tested in relation to the remaining category.

23/ Calculated from coefficient of alienation $K = 1 - \sqrt{1 - r^2}$

Table 6. FORMAL SOCIAL PARTICIPATION INDEX AND MEDIAN PARTICIPATION IN SPECIFIED CATEGORIES OF FORMAL SOCIAL PARTICIPATION

Formal participation score	Number of families	Median participation by category: Number of group affiliations	Times attended function	Dollars contributed	Committee memberships held	Offices held
Total	293	1.4	26.4	5.3	0.0	0.0
2- 3	85	0.5	0.0	0.0	0.0	0.0
4- 5	79	0.9	20.4	4.9	0.0	0.0
6- 7	57	1.4	44.9	12.1	0.0	0.0
8- 9	30	2.8	55.1	11.6	0.3	0.7
10-13	28	2.9	65.6	13.5 a/	0.5	0.4
14 and over	14	3.9 a/	87.7 a/	14.1 a/	2.9 a/	1.7 a/

a/ Median is more than the amount shown. Accurate calculations could not be made from grouped data since these are open-end intervals.

Construction and Standardization of an Abbreviated Scale for Measuring Formal Social Participation

Experience with the form used for obtaining detailed information concerning participation in organized groups and in scoring formal social participation by the method described above, suggested the desirability of a simplified scale for use in subsequent studies. It was difficult, for example, to secure estimates as to the amount of financial contributions to various organizations particularly to church groups. It was also hard to obtain in retrospect accurate information concerning the exact number of meetings attended. Membership data were somewhat easier to get and it was also easy to learn whether the husband or wife had served as an officer of an organization or as a committee member. There was, however, some trouble in learning just how many committee memberships a particular person had had during the year of study. The matter of scoring the data once obtained was a laborious process.

In seeking a simplified method of handling formal social participation data, the use of only membership information was considered, but was excluded because the coefficient of correlation, r, of this type of participation with other types indicated that it was inadequate for purposes of prediction of the other types. The use of attendance data would have been better, but still inadequate as a means of predicting the score based upon the five categories of affiliation, attendance, contributions, committee service, and officerships held. By these tests, none of the five categories could be used separately. 24/

24/ Conrad R. Taeuber tested intercorrelations between each of these categories and found them closely related but not sufficiently close to predict accurately one from the other (my own interpretation). Memberships and contributions were generally highly correlated, r = .89 and others ranged down to .36 (all positive). When r = .89, knowledge of the relationship is only 55 percent better than no information at all for purposes of prediction; when r = .36, knowledge of one factor improves chance estimates of the other factor by only 7 percent (based upon coefficient of alienation). Source: Group Participation with Reference to Socio-Economic Status, M. A. Thesis, University of Minnesota, 1929, pp. 20-24.

Inspection of the particular types of social participation suggested that certain types were closely related to the total index of formal participation calculated by the method used in the present study. Accordingly, 22 specific types of participation were selected for a rigorous testing to determine their diagnostic ability (table 7). In making a preliminary selection of the items to be tested several things were taken into account: (1) the effectiveness of the item in differentiating nonparticipants from occasional participants and both of these classes from active participants; (2) the ease with which information could be secured in interviews or in administration to an assembled group; (3) the representativeness of an item of the various items which made up the longer scale used in the study.

The method of testing diagnostic ability was comparable to that used in constructing the scale of level of living but certain short-cuts were taken.

Procedure for testing the diagnostic ability of the items was to sort the 293 schedules for which information was available into three piles of approximately the same number of families, 98 having scores of less than 4.3, 98 having scores of 4.3 to 7.1, 97 having scores of more than 7.1. These classes were not identical to the three classes of nonparticipants, occasional participants, and active participants as defined earlier, but were so nearly comparable that they may be referred to by the same names. 25/ Within each of the three groups, the percent of families participating in the ways indicated in each of the 22 statements (called items above) was calculated. For example, 27 percent of the husbands 26/ in nonparticipant families were members of churches, 69 percent of the husbands in occasional-participant families belonged to a church group, and 89 percent of the husbands in active-participant families were members of a church group (table 7). The next step was to find the difference between the percentages among the nonparticipants and occasional participants and between the occasional participants and the active participants, and to test the significance of these percentage differences. Tests of significance were made in exactly the manner described in testing level of living, i.e., the actual difference was divided by the standard of error of the difference to give a critical ratio. By this procedure two critical ratios were available for each of the 22 items tested.

An examination of table 7 shows that not all of the 22 items tested differentiated significantly between the three classes of participants. Membership and attendance of the husband in economic groups and membership and attendance of the wife in civic groups did not prove to be as valuable as had been expected from preliminary inspection for distinguishing nonparticipants from occasional participants and occasional participants from active participants. These items were, therefore, excluded from the final abbreviated scale. The criterion adopted for item selection was that a given item should differentiate significantly one of the three groups from the next one to it, i.e., that there should be a critical ratio of 3.0 or more.27/ It was recognized that items which differentiated both the lowest from the middle classification, and the

25/ These three terms are used in the sense here defined only in the present section while discussing the construction of the abbreviated scale. All other uses of the terms refer to the earlier definition.

26/ In constructing the abbreviated scale female heads of families were classified as wives. In the index used elsewhere in this study they were classified as heads. This change was made to simplify use of the scale in future studies. Comparisons between the two indices are not invalidated since only family indices (not individual) are compared.

27/ One item of 2.9 was retained.

Table 7.- PARTICIPATION IN ORGANIZED GROUPS IN SPECIFIED WAYS

Type of participation (item)	Percent of families participating a/				Critical ratio of percentage differences b/		
	All classes	Non-participants (1)	Occasional participants (2)	Active participants (3)	2-1	3-2	Average c/
No. of families represented	294	98	98	97	---	---	---
Husband member 1 or more church group.....	62	27	69	89	6.3	3.5	4.9
Wife member 1 or more church group.....	75	36	92	96	9.8	1.2	5.5
Husband member of education or extension group.....	26	3	21	52	3.7	4.6	4.2
Wife member of education or extension group.....	29	4	30	53	5.0	3.2	4.1
Husband member lodge.....	18	7	15	33	1.7	2.9	2.3
Wife member lodge.....	10	0	6	23	2.1	3.4	2.7
Husband attends church once month or more.....	47	8	52	81	7.5	4.5	5.9
Wife attends church once month or more.....	56	11	69	90	9.8	3.6	6.7
Husband attends education or extension group 2 times year or more.....	19	2	16	40	3.5	3.8	3.6
Wife attends education or extension group 2 times year or more.....	22	2	23	41	4.5	2.7	3.6
Husband attends lodge every 2 months or more.....	10	0	5	24	2.0	3.8	2.9
Wife attends lodge every 2 months or more.....	8	0	4	20	2.0	3.5	2.7
Husband contributed $10 or more to groups.....	39	0	35	80	7.1	7.0	7.1
Wife contributed $10 or more to groups.....	38	0	34	79	6.9	6.9	6.9
Husband serves on committee of organization.....	18	0	4	50	2.0	8.2	5.1
Wife serves on committee of organization.....	21	0	8	53	2.9	7.6	5.2
Husband serves as officer in organization.....	20	0	5	53	2.3	8.4	5.3
Wife serves as officer in organization.....	16	0	3	43	1.8	7.4	4.6
Wife member of patriotic or civic group.....	4	1	4	6	1.4	0.6	1.0
Husband member of co-op or other economic group.....	16	6	9	33	0.8	4.2	2.5
Wife attended 6+ meetings patriotic or civic group..	2	0	0	6	0.0	2.5	1.3
Husband attended at least 1 co-op or economic meeting.	12	2	4	28	0.8	4.7	2.8

a/ Husbands and wives.
b/ Actual difference divided by standard error of the difference.
c/ Average of the two critical ratios shown.

middle from the highest classification were more diagnostic of total participation than were those which differentiated only one of the pairs, yet only 8 items could have been retained if critical ratios of 3.0 had been required in both comparisons for each item. By the standard adopted, 18 items were retained, 10 of which differentiated significantly the nonparticipants from the occasional participants, and 15 of which differentiated significantly the occasional participants from the active participants. All of 18 items differentiated significantly the nonparticipants from the active participants.

The weights assigned to each item were the averages (mean) of the two critical ratios (table 7). These values were revised, however, by equating the average (median) total family score to 100 (see weights given on the abbreviated scale). This revision was made to facilitate comparison of the distribution of the 293 sample families with other distributions. It is the revised weights which appear on the abbreviated scale. For purposes of comparing any subsequent sample of Ohio farm families scored by the abbreviated scale with the distribution of families scored by the longer scale of formal social participation, table 8 was prepared. Scores of 100 may be considered approximately average for farm adults of the State of Ohio. Families scoring above 171 are in the upper one-fourth, those above 222 are in the upper one-tenth, those below 38 are in the lower one-fourth, etc.

Table 8.- QUARTILE AND DECILE VALUES OF FORMAL-SOCIAL PARTICIPATION SCORES OF OHIO FARM FAMILIES a/

Quartile	Score	Decile	Score	Decile	Score
1	38	1	15	6	126
2	100	2	30	7	156
3	171	3	51	8	186
-	-	4	77	9	222

a/ Scored by the weights shown on the abbreviated scale, page 26.

As a means of determining the validity of the abbreviated scale of formal social participation, the sample families were scored upon the form provided and a test made of the correlation of these scores with the index of formal social participation used in the present study, i.e., the longer scale based upon detailed itemization of the extent of affiliation, attendance, contributions, committee service, and officerships in various organizations. The Pearsonian coefficient of correlation between the two scores was r = .92; standard error of sampling = .06. Another test was made, namely, the calculation of a coefficient of correlation of the abbreviated scale with six comparable items of Sewell's scale: 28/ r = .85; Er = .06. By these tests, the abbreviated scale may be regarded as a valid measure of formal social participation.

Reliability of the 18 items to measure consistently the same thing was tested by the split-half method and a correlation coefficient of r = .83 was found; standard error of sampling = .06. When this value of r was corrected by the Spearman-Brown formula, $\bar{r}$ = .90. By the usual standards the items may be regarded as reliable.

28/ Sewell, op. cit. p. 45.

SCALE OF PARTICIPATION OF OHIO FARM ADULTS IN COMMUNITY ORGANIZATIONS

Name of family _____ Number _____
Post office address _____ R.F.D. No. _____
County _____ Township _____
Interviewer _____ Date _____

Instructions: Base all entries upon participation during the last year preceding the interview. Check every type of participation for both the husband and the wife. Items checked "yes" are scored the value indicated to the right of the "yes" column. The family score is the summation of the scores for the individual items. Where either wife or husband is not applicable or where information is not available for one or the other of them the family score may be estimated by multiplication of the score of one person by two.

Type of participation	Husband			Wife			FAMILY SCORE
	NO	YES	SCORE	NO	YES	SCORE	
Member of one or more church groups a/			18			20	
Member education or extension group b/			16			15	
Member of lodge (Grange included)			9			10	
Attend church once a month or more			22			25	
Attend educational or extension group two times a year or more			13			13	
Attend lodge every two months or more			11			10	
Contribute $10.00 or more to groups			27			26	
Serve on committee of organization			19			19	
Serve as officer in organization			20			17	
Total family score							

a/ Include as church group preaching services, Sunday school, and any other official church organizations.

b/ Include Farmer's Institutes. Consider as members, persons who have attended at least one-half of meetings during past two years.

Several cautions should be made concerning the use of this scale in future studies. (1) The sample upon which this scale is based was selected largely upon the basis of level-of-living information since very little was known about social participation in the State. (2) Only a small proportion of the possible types of participation was tested, although there was reason to believe that the items included were among the most important ones. (3) The scale is limited to formal participation and does not take account of innumerable activities which may serve as substitute forms of association in satisfying basic human needs. (4) The scale is more applicable to group comparisons than to diagnosis of a particular family.

Measuring Informal Social Participation

So diverse are the forms of social activity aside from participation in formally organized groups that they are difficult to identify. Visiting, attending parties, and going to movies are common types, but in addition a variety of hobbies and other social activities are casually pursued. Closely related to overt or active social participation is vicarious or imagined social life. Listening to radio programs, reading, or gossip by telephone provide highly satisfactory social life for some people. In the present study an attempt was made to get information concerning informal social participation, but the range of material covered is by no means exhaustive. Field experience suggests that much more information is needed. Since a large number of specific forms of activity were not named, respondents likely overlooked some of their activities. This omission precluded full understanding of this segment of social life and it is admitted that the present study is lacking in this respect.

A crude index of informal activity was constructed by direct addition of the reported number of times in which each activity was engaged during the year preceding the interview. Its main shortcomings are its failure to include all forms of activity and the assumption which it makes that a single visit is comparable to attending a movie or a party. So inadequate was the index that it was not used. In the analysis made in bulletin 622 specific forms of informal participation were, therefore, considered separately and with full awareness of their limitations.